

A STUDY ON STOCK EXCHANGES & SUSTAINABLE DEVELOPMENT

P. Vijaya

Asst. Professor, Department of Business Management
RBVRR Women's College, Narayanguda, Hyderabad, India

Dr. P. Sreenivas Reddy

Professor, Department of Business Management
Institution: Vignan University,
Vadlamudi, Guntur, India

ABSTRACT

Sustainability and Sustainable Development have emerged as the most important goals of the world today. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. The Sustainable Development Goals (SDGs), otherwise known as the Global Goals, are a universal call to action to end poverty, protect the planet and ensure that all people enjoy peace and prosperity. These 17 Goals build on the successes of the Millennium Development Goals, while including new areas such as climate change, economic inequality, innovation, sustainable consumption, peace and justice, among other priorities. They provide clear guidelines and targets for all countries to adopt in accordance with their own priorities and the environmental challenges of the world at large.

The overarching goal of sustainability has led to a growing pressure on nations and various stakeholders in meeting the SDGs.

Stock Exchanges play a key role in determining the health of a business and economy. They provide a central point for the interaction between investors, companies, policymakers and regulators. The stock exchanges recognizing this have evolved to meet the SDG's through developing sustainability indices and incorporating sustainability reporting and practices.

The Article aims at the study of the evolution of stock exchanges in the movement towards sustainable development and the development of sustainable indices and practices,

Key words: Sustainability, SDG, Sustainable Stock Exchange, Sustainable Index

Cite this Article: P. Vijaya and Dr. P. Sreenivas Reddy, A Study on Stock Exchanges & Sustainable Development. *International Journal of Management*, 8(2), 2017, pp. 112–122. <http://www.iaeme.com/IJM/issues.asp?JType=IJM&VType=8&IType=2>

INTRODUCTION

"Stock exchanges are uniquely positioned at the intersection between investors, companies, and regulators. As such they can play a key role in promoting responsible investment and sustainable development."

- **Mr. James Zhan**

- Director, Division on Investment and Enterprise, UNCTAD
- 2012 SSE Global Dialogue in Rio de Janeiro, Brazil

Stock exchanges provide a central point for the interaction between investors, companies, policymakers and regulators. Exchanges have traditionally played a crucial role in building transparent, regulated markets and promoting best practices in financial and corporate governance disclosure among listed companies.

Today, exchanges are also well suited to help with the 21st century sustainable development challenge. They are uniquely placed to facilitate action as regards sustainable business, with a variety of measures at their disposal. These include listing requirements related to sustainability reporting, voluntary initiatives, guidance documents and training for both companies and investors, and sustainable investment products such as indexes that focus on ESG issues.

The diversity of stock exchanges around the world makes reviewing their sustainability initiatives a challenge. Comparability is difficult due to wide differences in the regulatory powers that exchanges possess, which can range from significant (comparable to securities regulators) to moderate to non-existent.

In virtually all markets, however, exchanges maintain significant 'soft-power' in terms of their ability to influence market participants through voluntary schemes. Exchanges have a number of motivating factors for the promotion of sustainability reporting initiatives.

A 2013 survey of exchanges by EIRIS found that key motivations included:

- To improve the environmental, social and corporate governance performance of companies listed on their exchanges.
- To encourage and to help investors engage with companies on sustainability issues.
- To identify themselves in the marketplace as committed to sustainability.
- To foster improved company performance, with the aim of promoting the sustainable long-term viability of companies, and the market and stock exchanges themselves, and to that end an interest in the latest research that explores links between long-term financial performance and ESG issues.

Policymakers and regulators

The SSE's 2012 Report on Progress noted that, in addition to the efforts taken by individual stock exchanges to increase ESG disclosure among their listed companies, there is also a role for regulators, governments and other actors in advancing ESG disclosure and reporting requirements.

There is a recognized need for enhanced levels of corporate transparency on ESG, and exchanges are well positioned in most jurisdictions to encourage and perhaps even require listed companies to produce better sustainability information. But many exchanges in both developed and developing countries require assistance with this effort.

A range of capital market stakeholders are increasingly recognizing the need for more widespread and consistent ESG disclosure, and are looking to policymakers and regulators for

potential solutions. With more than a decade of voluntary initiatives and thousands of large companies producing ESG reports, there is an increased focus on efforts to ensure that improved sustainability performance percolates down from leading companies to the majority who are yet to adopt ESG disclosure practices.

There are an estimated 80,000 transnational corporations in the world and yet there are only about 5,000 to 10,000 companies producing ESG reports. There is also growing interest among investors and other report users to ensure that reports are issued consistently and with comparable information.

Stock exchanges themselves, especially large internationally competitive exchanges, are expressing an interest in industry-wide solutions so as to avoid making ESG disclosure something that could potentially affect the competitive position of first movers. In sum, there is broad demand for the type of comprehensive approach traditionally offered by public policy. The Report on Progress therefore provides a snapshot of what policymakers (represented by G20 member States) and regulators (represented by IOSCO board members) are currently doing in this area.

The G20 countries account for two-thirds of the world's population, 85 per cent of its GDP and 75 per cent of global trade (G20 2014). Its members therefore have the influence to lead the way in ESG disclosure and reporting initiatives. The grouping also has the advantage of including both developed and developing countries. IOSCO, meanwhile, is the global standards setter for securities commissions and includes more than 120 securities regulators, who are responsible for regulating more than 95 per cent of the world's securities markets (IOSCO 2014). Securities commissions around the world are playing an increasing role in promoting sustainability disclosure. IOSCO therefore could be well placed to provide leadership in this area.

There is a growing discussion of sustainability and ESG disclosure requirements at the international level. This is reflected in the growth of the SSE initiative in terms of the number of partner stock exchanges and the extent of its engagement activities with other actors in this space such as investors, the private sector, and regulators and policymakers. It is also reflected in recent developments at the World Federation of Exchanges (WFE) with its Sustainability Working Group, and the International Integrated Reporting Council (IIRC) with its Corporate Reporting Dialogue.

Stock exchange initiatives

The report looked at 55 stock exchanges around the world (Table 2.1), including the members of the World Federation of Exchanges (WFE) (excluding those focused primarily on futures and options) as well as SSE partner exchanges that are not members of the WFE. Combined, these exchanges host more than 45,000 companies with over \$65 trillion in market capitalisation.

This analysis nearly doubles the number of stock exchanges reviewed in the 2012 Report on Progress and is intended to provide a snapshot of the exchanges' efforts towards introducing sustainability measures and products.

Sustainability indices

Sustainability indices remain the most popular type of sustainability initiative among stock exchanges, with 23 of the 55 exchanges offering at least one index integrating social and/or environmental issues.

Two exchanges reviewed in the 2012 Report on Progress have since added sustainability indices: the Shenzhen Stock Exchange and SIX Swiss Exchange. Training and guidance can

help prompt the integration of sustainability information in investment decision making by offering guidance documents and formal training to their listed companies and investors.

Over a third of the exchanges reviewed provide either guidance or training to the listed companies on their exchange. Of these, three also provide guidance documents to investors, and four provide investor training on the need to integrate sustainability into investment decisions.

Sustainability reporting

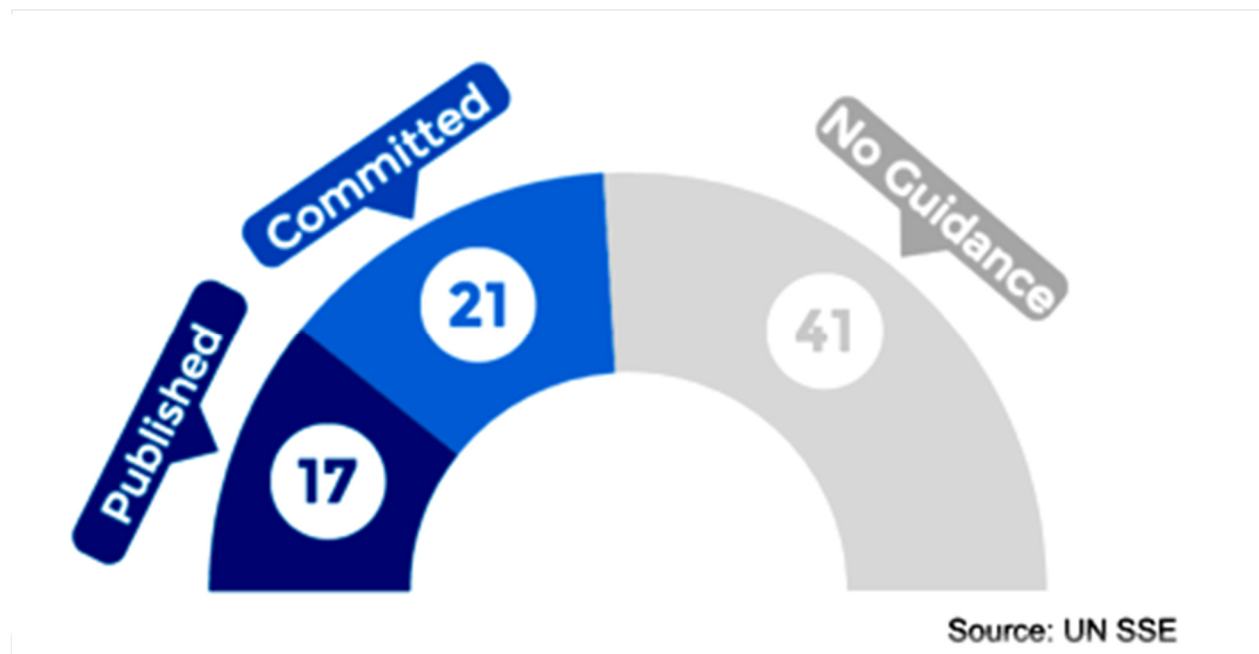
Of the 55 exchanges reviewed, seven require some environmental and social reporting for all their listed companies, while an additional five exchanges require such reporting for companies of a specific size or within a specific industry.

In addition to these twelve exchanges, three others make strong recommendations to disclose such information and, in some cases, provide or refer to specific sustainability report guidance. In all, over a quarter of the exchanges reviewed either requires or recommends some environmental and social reporting for companies listed on their exchange.

As many as 21 stock exchanges across the world could introduce sustainability reporting standards in the coming months. They would join the 17 exchanges that currently recommend listed companies to report on environmental, social and governance (ESG) issues — going a step further by providing model guidance to participating companies.

These exchanges have pledged to list their guidance on the Sustainability Stock Exchanges (SSE) initiative. It's a peer-to-peer platform that invites global exchanges to promote ESG disclosure among listed companies and among each other. SSE includes over 60 exchanges — representing more than 70 percent of listed equity markets — and more than 30,000 companies with a market capitalization over \$55 trillion.

"Sustainability reporting has come of age", said James Zhan, director of the division on Investment and Enterprise at the U.N. Conference on Trade and Development (UNCTAD), which works on trade, investment, finance and technology issues in developing countries. Companies are demanding sustainability guidelines outside of the top-down push from government agencies and NGOs, he added.



The 21 exchanges "have confirmed to us they will introduce new guidelines either this year or within the first quarter of next year, and we know that many of them are close because they have posted draft guidelines on their websites for comment and discussion", Zhan's statement detailed.

By reporting on sustainability issues, companies tend to act more sustainably, Zhan said, explaining the incentive of a positive correlation between strong sustainable performance and financial performance. The private sector is critical for achieving the UN Sustainable Development Goals, and involving stock exchanges could mobilize thousands of private companies to move forward.

After all, stock exchanges enable businesses to create value and jobs. They set the pace for corporate growth, but growth left unguided can kindle an unsustainable hunger for quick profits. At the same time, stock exchanges are responsive to market demand, political shifts and the cultures in which businesses operate. The market reflects when companies offer innovative products, better practices and transparent data, encouraging other organizations to follow.

Launched in 2009 by UN secretary-general Ban Ki-Moon, the SSE is a joint effort of the UNCTAD collaborated with the UNCTAD Investments and Enterprise Division, the UN Global Compact, the United Nations Environment Programmes Finance Initiative and the Principles for Responsible Investment (all organizations dedicated to the advancement of ethical, environmentally and socially sound business growth).

The 21 stock exchanges pledged to list their guidance on the Sustainability Stock Exchanges (SSE) initiative, a peer-to-peer platform that invites global exchanges to promote ESG disclosure among listed companies and among each other.

The benefits of breaking barriers

There has long been a call for bridging the barrier between sustainability and investor relations. A recent report by Sustainability, *Closing the Sustainability-Investor Relations Gap*, makes the case for stronger internal engagement between sustainability and investor relations departments.

It outlines five points of misalignment between sustainability strategy and IR teams:

1. Differing language used to describe and measure company performance.
2. Investors desiring short-term results while sustainability teams focus on issues that play out over the medium- to long-term.
3. Inadequate mutual comprehension and technical capacity in the respective disciplines of IR and sustainability.
4. Lack of strong relationships between IR and sustainability team members
5. Not enough staff or resources to integrate sustainability data to investor communications.

Yet healing this divide benefits all parties and boosts profits, Sustainability says. And robust ESG reporting would attract new long-term investors seeking deeper business risk and opportunity analysis and who want to understand the business's social and environmental context. Plus, sustainability teams with a good knowledge of investor needs would tailor their reporting to be more relevant and clearly communicate the financial value of their efforts.

A company would gain greater trust and credibility with investors, as well as reduce the effort and time needed to respond to investor surveys and ad-hoc inquiries relating to sustainability.

Furthermore, according to Sustainability, "Stock exchanges and other governing bodies are increasingly making changes to their requirements for corporate disclosure on these issues."

The stock exchanges that have committed to the SSE to provide ESG guidelines to their listed companies hail from all over the world:

- **Norway** – Oslo Børs
- **Spain** – Bolsas y Mercados Españoles
- **Chile** – Bolsa de Comercio de Santiago
- **Denmark** – Nasdaq Copenhagen
- **Egypt** – Egyptian Exchange
- **Estonia** – Nasdaq Tallinn
- **Finland** – Nasdaq Helsinki
- **Iceland** – Nasdaq Iceland
- **Italy** – Borsa Italiana (LSE Group)
- **Kazakhstan** – Kazakhstan Stock Exchange
- **Kenya** – Nairobi Securities Exchange (NSE)
- **Latvia** – Nasdaq Riga
- **Lithuania** – Nasdaq Vilnius
- **Mexico** – Bolsa Mexicana de Valores
- **Morocco** – Bourse de Casablanca
- **Nigeria** – Nigerian Stock Exchange
- **Qatar** – Qatar Stock Exchange
- **Romania** – Bucharest Stock Exchange
- **Seychelles** – Trop-X
- **Sweden** – Nasdaq Stockholm
- **UK** – London Stock Exchange
- **Vietnam** – Hanoi Stock Exchange
- **Vietnam** – HoChiMinh Stock Exchange

To date, only the Spanish and the Norwegian stock exchanges have published their voluntary ESG market guidelines. The latter, the Oslo Børs exchange, includes 213 companies and has a domestic market capitalization of more than USD \$200 million. Its guidance document backs up Sustainability's argument, stating:

Investors are increasingly attaching weight to a range of risks related to corporate sustainability. These risks include climate issues and the environment, corruption, human and labor rights, suppliers and customers, taxation and competition. These are areas that can be of great significance to the preconditions for a company to create profitability and shareholder value over the long term.

"Norwegian legislation has for several years included mandatory ESG reporting for companies that are listed on Oslo Børs," she said. "But there are in some cases gaps between the information published by the companies and the information that investors and other stakeholders to be able to properly assess the companies' ability to create long-term shareholder value."

The exchange's main challenge was finding a balance between meeting investors' expectations for additional information while minimizing the reporting burden for listed companies, Dyvik said. And it developed the guidance in collaboration with a working group

made up of an independent association of asset managers and representatives from the exchange's listed companies.

The group consulted with issuers, member firms, investors, mutual fund managers and others important to the Oslo Børs exchange to ensure the draft was ready for its board of directors. The resulting guidance, which is based on the Global Reporting Initiative's G4 Sustainability Reporting Guidelines, is a four-step process that begins with a materiality analysis.

"The guidance does not define indicators that companies should report on, but leaves it up to the companies to define relevant indicators to report on and follow up based on their materiality analysis," Dyvik said. Companies are recommended to start following the guidance starting in the 2017 financial year — and the exchange plans on providing a list of the companies that report per the guidance.

The U.S. New York Stock Exchange (NYSE), Euronext and the Shanghai Stock Exchange are conspicuously missing from the SSE's list. The Shanghai Exchange's Sustainability guidelines are supported by the International Finance Corporation.

The World Federation of Exchanges, which is chaired by NASDAQ and comprises 25 stock exchanges including the NYSE, Deutsche Börse, Shenzhen Stock Exchange and the National Stock Exchange of India, includes overlap with some of the SSE's guidance.

"Market expectations are shifting quickly and we see more and more stock exchanges viewing sustainability reporting as necessary and inevitable," said Anthony Miller, UNCTAD's SSE initiative coordinator. "Those expectations create their own momentum."

SDG'S for STOCK EXCHANGES

Making an Impact our evaluation of the SDGs found four relevant goals that stock exchanges are best positioned to support. In addition, there is one underpinning action that will allow exchanges to impact these four areas and other SDGs.

- Gender Equality (Goal 5)
- Sustainability Information (Goal 12)
- Climate Change (Goal 13)
- Global Partnerships (Goal 17)
- Underpinning Action: Mobilizing Finance

Goal 5: Gender Equality

Target 5.5: Ensure women's full and effective participation and equal opportunities for leadership at all levels of Decision-making in Political, Economic, and Public life. An example of leadership already underway is the bell ringing ceremonies seven SSE Partner Exchanges held in 2015 in collaboration with UN Women and UN Global Compact in support of empowering women in the workplace, marketplace and community.

What firms can do to further gender equality:

- Promote gender diversity on the boards and management of listed companies by incorporating gender equality and the empowerment of women into your guidance, training and events.
- Ensure accessibility of capital market services to female entrepreneurs of all ages.

Goal 12: Sustainability Information

Target 12.6: Encourage companies, especially large and trans-national companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle. Many stock exchanges are already playing a key role in achieving target 12.6 by providing guidance

and training for companies and strengthening listing requirements. By focusing on these actions, exchanges play a vital role in achieving this target and ensuring transparency in their markets.

What firms can do to enhance sustainability information:

1. Provide guidance and training for companies on environmental, social and governance (ESG) reporting: The SSE is supporting exchanges in this endeavor through the development of the Model Guidance on Reporting ESG Information to Investors to help exchanges address the growing need for sustainability information.
2. Develop sustainability indices that encourage companies to publicly disclose ESG information by highlighting the highest quality reporters.
3. Update listing requirements to provide a consistent and comparable baseline for sustainability data.

Goal 13: Climate Change

Improve education, awareness raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction, and early warning.

Stock exchanges can play a leading role in creating climate resilient markets. Numerous exchanges are already offering related financial products as well as encouraging or requiring disclosure in this area. - Assist companies by providing guidance in making sustainability information public. Dialogue - Engage your fellow exchanges and your investors and issuers with an SSE Communication to Stakeholders. Listing Requirements - Strengthen your listing requirements to encourage the disclosure and use of sustainability information. Join a Global Partnership-Join the SSE, and participate in its workgroups to share best practices and promote sustainable markets. Sustainability Products - Help incentivize and mobilize finance for SDG areas through products such as ESG indices and bond listings.

What firms can do to help mitigate climate change:

1. Create and promote financial products that stimulate awareness or mobilize finance towards 'green growth' sectors.
2. Provide guidance and training to both companies and investors on climate-related disclosure initiatives.
3. Support national and international policies to maximize benefits and minimize risks related to low-carbon investment.

Goal 17: Global Partnerships

Target 17.16: Enhance the global partnership for sustainable development complemented by multi-stakeholder partnerships that mobilize and share knowledge, expertise, technologies and financial resources to support the achievement of sustainable development goals in all countries, particularly developing countries. Exchanges have always played a key role in bringing stakeholders together, and now more than ever they will be pivotal players in achieving global efforts. By working with the SSE, some exchanges are already making their mark in this area.

What firms can do to foster global partnerships:

1. Enhance the dialogue by joining the SSE as a Partner Exchange participating in the SSE Global & Regional Dialogues and engaging in relevant SSE work streams.
2. Educate your market, as a conduit between investors and listed companies, to encourage collective action.
3. Engage your fellow exchanges; reach out to your peers for advice, practical examples and support.

Underpinning Action: Mobilizing Finance

One of the key questions arising as the world's governments embark on a new set of development goals is how to finance these 169 targets. Stock exchanges have an important role to play to enable innovative financing mechanisms and promote a reorientation of financial markets through improved corporate sustainability reporting. What you can do to mobilize finance towards the SDGs:

1. Support sustainability-related indices, bonds and other products. Different financial products can mobilize capital for various thematic areas that fall under the SDGs. For example, by creating a green bond listing, exchanges not only mobilize finance, they also provide opportunity for the growth of the sustainable bond market by setting the regulations and standards for these products in the markets they serve.
2. Encourage long-term, sustainable investments. Providing resources and enhancing listing rules to strengthen corporate sustainability reporting could help promote long term responsible investment in sustainable business practices.
3. Help nascent exchanges in low-income countries mature, supporting domestic mobilization of capital.

BSE being a responsible stock exchange is taking various initiatives in the domain of sustainability and corporate social responsibility. BSE has launched theme based indices like S&P BSE Carbonex and S&P BSE Greenex. BSE is also participating in the sustainable stock exchanges initiative. BSE has signed Memorandum of Understanding with Ministry of Corporate Affairs to launch corporate social responsibility index.

Sustainable Stock Exchanges (SSE)

The United Nations had been playing a catalyzing role through a series of Global Dialogues - held in New York (2009), Xiamen (2010) and Rio de Janeiro (2012) - the initiative had become a platform for exploring how exchanges can work with investors, regulators and companies to enhance corporate sustainability and promote responsible investment. The Exchange's proactive work had been noticed by UNCTAD. UNCTAD has approached BSE to get on board of SSE by signing the commitment letter to promote long term sustainable investment and improved environmental, social and corporate governance disclosure

BSE is the first stock exchange from Asia to join Sustainable Stock Exchange Initiative.

BSE - Corporate Social Responsibility Index

BSE and Indian Institute of Corporate Affairs (IICA - Established by Ministry of Corporate Affairs), have signed a Memorandum of Understanding (MoU) on September 23, 2013 to work collaboratively in the domains of business sustainability, Corporate Social Responsibility (CSR), investor education and other allied areas. BSE - IICA are going to launch Corporate Social Responsibility Index. An Advisory Committee (AC) consisting officials from IICA and BSE is formed to guide the CSR Index construction, design and roll-out processes. This Advisory Committee will be having a consultative approach and shall interact with various stakeholders.

"CSR and sustainability are two extremely important topics for 2013, especially with the passing of The Companies Act 2013. They also represent the aspirations of youth as well as society. This conclave being very timely and the discussions being detailed, I'm sure the participants will be able to gather a lot of executable knowledge about how to go about in setting up the CSR framework in their organizations when they go back." said Mr. Ashish K. Chauhan, MD & CEO, BSE Ltd. on the occasion of "CSR & Sustainability Conclave 2013" organized by Dun & Bradstreet.

Corporate Social Responsibility (CSR) in BSE is aligned with its tradition of creating wealth in the community with a three pronged focus on Education, Health and the Environment. Besides funding charitable causes for the elderly and the physically challenged, BSE has been supporting the rehabilitation and restoration efforts in earthquake-hit communities of Gujarat. BSE has been awarded the Golden Peacock Global - CSR Award for its initiatives in Corporate Social Responsibility (CSR) by the World Council of Corporate Governance.

BSE-Carbon Disclosure Project (CDP) initiative

BSE signed Memorandum of Understanding with CDP India to jointly carry out activities for creating awareness about filing sustainability data / Environment, Social and Governance (ESG) data with CDP.

CDP is a nonprofit organization which works with other CDP entities worldwide to provide a transformative global system for thousands of companies and cities to measure, disclose, manage and share environmental information. CDP India is actively in touch with Top 200 (BSE-200 constituents) companies to encourage them to report non financial data. The data received from CDP will be used for the calculations of S&P BSE Carbonex. "BSE with more than 5,200 listed companies is one of the largest Exchanges in the World and the first Exchange from Asia to join United Nations Sustainable Stock Exchanges (SSE) initiative. BSE's objective is for Indian Companies to look beyond shareholder value and make sustainability a core driver of their strategy. S&P BSE Carbonex Index, using CDP data, calculated by Asia index Private Limited is a key step in this direction. S&P BSE CARBONEX uses risk-tilted version of established S&P BSE-100 index. Weights of the constituents are adjusted to reflect their climate risk relative to industry peers.

In addition, the BSE has also entered into an MOU with Indian Institute of Corporate Affairs established by the Ministry of Corporate Affairs, Government of India for creating benchmarks indices in the area of Corporate Social Responsibility." Ashish Kumar Chauhan MD & CEO BSE Ltd

CONCLUSION

Nearly 60 stock exchanges, representing more than 70% of listed equity markets, and some 30,000 companies with a market capitalization of over \$55 trillion, have now made a commitment to "advancing sustainability in their markets" by joining the SSE Initiative, the initiative's 2016 progress report said.

This includes the Singapore Exchange (SGX) which joined during the 2016 SSE Global Dialogue held in Singapore on 6 September.

Stock exchanges are uniquely positioned to influence their market in a way few other players can. In addition to their ability to influence investor and company behaviour, exchanges often support regulators in promoting the adoption of market standards.

The transition to a sustainable financial system means that "market incentives must be aligned with long-term values and environmental, social, and governance considerations need to be integrated into standard practice," the report says.

Twelve SSE partners now incorporate reporting on environmental, social, and governance information into their listing rules and 15 provide formal guidance to issuers, the report said.

"The Sustainable Development Goals outline many of these environmental, social, and governance factors and provide a framework to address them," the report says.

Stock exchanges can take concrete steps on five of the 17 SDGs, adopted by UN member States in September 2015, the report says

"*Achieving the SDGs requires significant financing, estimated at \$5-7 trillion per year,*" the report says, citing UNCTAD's 2014 World Investment Report.

"While public funding and development assistance remains important, the scale of the investment challenge requires new flows of private capital," it says.

REFERENCES

- [1] <https://www.greenbiz.com/article/sustainability-reporting-stock-exchanges-comes-age>
Sustainability reporting in stock exchanges 'comes of age' Anya Khalamayzer
Wednesday, December 7, 2016
- [2] <http://www.bseindia.com/static/about/sustainability.aspx>
- [3] <http://unctad.org/en/pages/newsdetails.aspx>
- [4] <http://www.sseinitiative.org/wp-content/uploads/2015/09/SDGs.pdf>
- [5] www.SSEinitiative.org/SDGs ESG Reporting Guidance
- [6] <https://www.cdp.net/EN-US/WHATWEDO/Pages/India.aspx>
- [7] Sindhu .K.P, Dr. Kalidas .M.G, Anil Chandran. S, A Study on Factors Influencing Investor Sentiment In Indian Stock Market, International Journal of Management (IJM), Volume 5, Issue 1, January (2014), pp. 07-13
- [8] Vineetha S Das and Dr. K Krishnakumar A. Over Reaction and Underreaction in Indian Stock Market: Comparison based on Analysis Considering Two Different Sets of Stocks - Short Term and Long Term Perspective, International Journal of Industrial Engineering Research and Development, 7(2), 2016, pp. 63–74.
- [9] Dr.G.S.David Sam Jayakumar and L.Vijayalakshmi. Modeling the Stock Volatility of top Industrial Returns Listed in BSE. International Journal of Management, 7(2), 2016, pp. 354-367.